Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Critical illness evidence-based nutrition practice guideline.

Bibliographic Source(s)

Academy of Nutrition and Dietetics. Critical illness evidence-based nutrition practice guideline. Chicago (IL): Academy of Nutrition and Dietetics; 2012. Various p.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: American Dietetic Association (ADA). Critical illness evidence-based nutrition practice guideline. Chicago (IL): American Dietetic Association (ADA); 2006 Sep. Various p.

Recommendations

Major Recommendations

Ratings for the strength of the recommendations (Strong, Fair, Weak, Consensus, Insufficient Evidence), conclusion grades (I-V), and statement labels (Conditional versus Imperative) are defined at the end of "Major Recommendations" field.

Critical Illness Update (CIU): Nutrition Assessment of Critically Ill Adults

CIU: Assessment for Critically Ill Patients

The registered dietitian's (RD) assessment of critically ill adults should include, but not be limited to the following:

Food and Nutrition-Related History

- History of nutrient intake (energy intake, meal-snack pattern, macro- and micronutrients, etc.)
- Adequacy of nutrient intake/nutrient delivery
- Bioactive substances (alcohol intake, soy protein, psyllium, fish oil)
- Previous and current diet history, diet orders, exclusions and experience, cultural and religious preferences
- Changes in appetite or usual intake (as a result of the disease process, treatment, or comorbid conditions)
- Disease-specific nutrient requirements
- Food allergies/intolerances
- Appropriateness of nutrition support therapy for the patient

- Food and nutrient administration (oral, enteral or parenteral access)
- Physical activity habits and restrictions

Anthropometric Measurements

- Weight, height
- Weight change
- Body mass index (BMI)
- Body compartment estimates (fat mass, fat-free mass)

Biochemical Data, Medical Tests and Procedures

- Biochemical indices (glucose, electrolytes, others as warranted by clinical condition)
- Implications of diagnostic tests and therapeutic procedures (indirect calorimetry measurements, radiography for confirmation of feeding tube placement, other gastrointestinal [GI] diagnostic tests)

Nutrition-Focused Physical Findings

- Nutrition-focused physical examination that includes, but is not limited to: fluid assessment, functional status, wound status, clinical signs of malnutrition/overnutrition and/or nutrient deficiencies
- Intake and output (I's and O's) including stool and fistula output, wound drainage
- Existing or potential access sites for delivery of nutrition support therapy
- Abdominal exam
- Fluid status (edema, ascites, dehydration)
- Vital signs

Client History

- Medical and family history and comorbidities
- Surgical intervention
- Effect of clinical status on ingestion, digestion, metabolism and absorption and utilization of nutrients
- Indicators of acute or chronic nutrition support-related complications
- Medication management
- Factors that may influence existing or potential access sites for delivery of nutrition support therapy

Assessment of the above factors is needed to correctly diagnose nutrition problems and plan nutrition interventions. Inability to achieve optimal nutrient intake may contribute to poor outcomes.

Consensus, Imperative

CIU: Reassessment of Critically Ill Adults

The RD reassessment of critically ill adults should include:

- Changes in nutrient needs
- A determination of daily actual intake of enteral nutrition (EN), parenteral nutrition (PN) and other nutrient sources
- EN/PN access site
- Changes in clinical status, weight, biochemical data and intake and output (I's and O's)
- Changes in nutrition-focused physical assessment findings

Consensus, Imperative

Recommendation Strength Rationale

- Consensus

CIU: Determination of Resting Metabolic Rate

CIU: Resting Metabolic Rate Predictive Equations for Non-obese Critically Ill Adults

If indirect calorimetry is not available, the RD should use the Penn State University (PSU[2003b])* equation in non-obese, critically ill

mechanically-ventilated adults. Research indicates that this equation has the best prediction accuracy in non-obese patients.

Fair, Conditional

CIU: Resting Metabolic Rate Predictive Equations for Obese Critically Ill Adults

If indirect calorimetry is not available, the RD should use the Penn State University (PSU[2003b])* equation in critically ill mechanically-ventilated adults with obesity who are less than 60 years of age. For obese patients 60 years or older, the PSU(2010)** equation should be used. Research indicates that these equations have the best prediction accuracy.

*PSU(2003b): Validated in 2009 and also referred to as Penn State equation. RMR = Mifflin (0.96) + VE (31) + Tmax (167) - 6212.

**PSU(2010): Validated in 2010 and also referred to as Modified Penn State equation. RMR = Mifflin (0.71) + VE (64) + Tmax (85) - 3085.

Fair, Conditional

Recommendation Strength Rationale

- Conclusion statements are Grades I, II, and III

CIU: Nutrition Prescription for Critically Ill Adults

CIU: Nutrition Prescription for Critically Ill Adults

The RD should develop a nutrition prescription for critically ill adults to include:

- Energy
- Protein
- Fiber
- Vitamins
- Minerals
- Fluid

Nutrition interventions are selected based on the nutrition prescription.

Consensus, Imperative

CIU: Enteral vs. Parenteral Nutrition

CIU: Enteral vs. Parenteral Nutrition

If EN is not contraindicated (e.g., by hemodynamic instability, bowel obstruction, high output fistula, or severe ileus) then the RD should recommend EN over PN for the critically ill adult patient. Research shows less septic morbidity, fewer infectious complications and significant cost savings in critically ill adult patients who received EN vs. PN. There is limited evidence that EN vs. PN affects hospital length of stay (LOS), but an impact on mortality has not been demonstrated.

Strong, Conditional

Recommendation Strength Rationale

- Conclusion statements are Grades I and II

CIU: Initiation of Enteral Nutrition

CIU: Initiation of Enteral Nutrition

If EN is not contraindicated (e.g., by hemodynamic instability, bowel obstruction, high output fistula, or severe ileus), then the RD should recommend that EN be started within 24 to 48 hours following injury or admission to the intensive care unit (ICU) (early EN). Research indicates that early EN (EEN) is associated with a reduction in infectious complications in critically ill, adult patients. The impact of EEN on mortality and LOS is unclear.

Strong, Conditional

Recommendation Strength Rationale

- Conclusion statements are Grades I and II

CIU: Gastric vs. Small Bowel Feeding Tube Placement

CI: Feeding Tube Placement

If a critically ill adult patient is mechanically ventilated and requires EN, the RD should recommend small bowel feeding tube placement. The largest research studies with ventilator-associated pneumonia (VAP) as a primary outcome, suggest that small bowel EN vs. gastric EN reduces VAP. However, other benefits (ensuring adequacy of nutrient delivery, and reducing costs of medical care, days on mechanical ventilation, and mortality) have not been demonstrated.

Fair, Conditional

Recommendation Strength Rationale

- Conclusion statements are Grades II, III, and V

CIU: Enteral Nutrition Energy Delivery

CIU: Enteral Nutrition Energy Delivery

If EN is not contraindicated (e.g., by hemodynamic instability, bowel obstruction, high output fistula, or severe ileus), the RD should make sure that at least 60% of the total estimated energy requirement, as determined by the nutrition assessment, is actually delivered to the patient within the first week of hospitalization. Research indicates that in critically ill adult patients receiving EN only, an average of at least 60% of EN energy actually received is associated with fewer infectious complications. The impact of a specific threshold of EN energy delivery on mortality, hospital LOS, and days on mechanical ventilation is unclear, due to inconsistent results. There were no studies evaluating impact on cost of medical care.

Fair, Imperative

Recommendation Strength Rationale

- Conclusion statements are Grades II, III, and V

CIU: Blue Dye Use in Enteral Nutrition

CIU: Blue Dye Use in Enteral Nutrition

The RD should recommend against adding blue dye to EN for detection of aspiration in critically ill adult patients. Research shows that the risk of using blue dye outweighs any perceived benefit. The presence of blue dye in tracheal secretions is not a sensitive indicator for aspiration.

Strong, Imperative

Recommendation Strength Rationale

- Conclusion statement is Grade III

CIU: Optimizing Enteral Nutrition Delivery

CIU: Patient Positioning

The RD should recommend that critically ill adult patients be positioned in a 30 to 45 degree head of bed elevation, if not contraindicated. Research shows that this practice decreases the incidence of aspiration pneumonia and reflux of gastric contents into the esophagus and pharynx.

Strong, Imperative

CIU: Gastric Residual Volume

When gastric residual volumes (GRVs) are used as one of the indicators for tolerance, the RD should recommend against holding EN when GRV is less than 500 ml in the absence of signs of intolerance (e.g., abdominal distention, nausea, vomiting) in critically ill adult patients. Research indicates that holding EN when GRV is less than 500 ml is associated with delivery of less EN. GRV does not correlate with risk for aspiration.

Fair, Conditional

CIU: Use of a Promotility Agent

If the critically ill adult patient has gastroparesis or GRVs ranging from 200 to 500 ml and there are no contraindications, then the RD should recommend the use of promotility agents. Research indicates that the use of a promotility agent has been associated with increased gastric emptying, improved EN delivery and possibly reduced risk of aspiration.

Strong, Conditional

Recommendation Strength Rationale

- Conclusion statements are Grades I and II

CIU: Immune-Modulating Enteral Nutrition

CIU: Enteral Formulas Containing Immune-Modulating Nutrients in Patients without Acute Respiratory Distress Syndrome (ARDS) or Acute Lung Injury

For ICU patients without ARDS, acute lung injury or severe sepsis, the RD should carefully evaluate using immune-modulating enteral formulas containing some combination of arginine, glutamine, nucleotides, antioxidants and fish oil. Some primary studies and meta-analyses with mixed populations have shown benefits in reducing infectious complications and hospital LOS. Research is inconclusive regarding reducing cost of medical care, days on mechanical ventilation, or mortality for mixed ICU patients, including surgical and trauma patients. Research on patients with ARDS or acute lung injury was not included in this analysis.

Fair, Conditional

CIU: Enteral Formulas Containing Immune-Modulating Nutrients in Patients with ARDS or Acute Lung Injury

For ICU patients with ARDS or acute lung injury, the RD may consider using immune-modulating enteral formulas with fish oil, borage oil and antioxidants.

Strong, Conditional

Recommendation Strength Rationale

- Conclusion statements are Grades II and III

CIU: Enteral Nutrition and Fiber

CIU: Addition of Fiber to Enteral Nutrition to Reduce Diarrhea

If the critically ill adult patient is receiving EN and the use of fiber is not contraindicated (e.g., by hemodynamic instability, severe dysmotility, or positive *Clostridium difficile*), the RD should consider using soluble fiber (e.g., guar gum) to prevent and/or manage diarrhea. Research indicates that diarrhea may be reduced in adult critically ill patients when guar gum is included in the EN regimen. The impact of other types of fiber on reducing diarrhea is unclear due to variations in the fiber combinations and amounts used in the studies.

Fair, Conditional

Recommendation Strength Rationale

- Conclusion statements are Grade II

CIU: Supplemental Glutamine

CIU: Supplemental Enteral Glutamine

In the critically ill adult patient, the RD should not routinely recommend supplemental enteral glutamine. When studies of burn patients are excluded, research has not shown glutamine-supplemented enteral nutrition to be associated with reduced LOS, cost of medical care, days on mechanical ventilation or mortality. There is limited evidence that supplemental enteral glutamine is associated with reduced infectious complications in the trauma patient.

Fair, Imperative

CIU: Supplemental Intravenous Glutamine

If a critically ill adult patient is receiving parenteral nutrition (PN), the RD should consider use of supplemental intravenous (IV) glutamine to reduce infectious complications. Research indicates that glutamine-supplemented PN reduced infectious complications in adult critically ill patients in four of five positive quality randomized controlled trials (RCTs). However, research shows that glutamine-supplemented PN does not reduce hospital LOS and there is no association between glutamine-supplemented PN and reduced cost of medical care, days on mechanical ventilation or mortality.

Strong, Conditional

Recommendation Strength Rationale

- Conclusion statements are Grades I, II, and V

CIU: Hypocaloric, High Protein Feeding Regimen

CIU: Hypocaloric, High Protein Feeding Regimen

In obese, critically ill adults, the RD may consider hypocaloric, high protein feedings. Very limited research in patients primarily receiving EN shows that the effect of hypocaloric, high protein feeding (<20 kcal per kg adjusted body weight [ABW] and 2 g protein per kg ideal body weight [IBW]) promoted shorter ICU stays, although total hospital length of stay did not differ. Nitrogen balance was not adversely affected. The effect of this feeding regimen on infectious complications, days on mechanical ventilation, mortality and cost of care is unsubstantiated.

Weak, Conditional

Recommendation Strength Rationale

- Conclusion statement is Grade III

CIU: Blood Glucose Control

CIU: Blood Glucose Control

In critically ill adult patients, the RD should promote blood glucose control between 140 and 180 mg per dL. Tight blood glucose control (80 to 110 mg per dL) is not associated with reduced hospital LOS, infectious complications, cost of medical care, days on mechanical ventilation or mortality and increases risk of hypoglycemia. Glucose level >180 mg per dL is associated with increased mortality.

Strong, Imperative

Recommendation Strength Rationale

- Conclusion statement is Grade II and III

CIU: Coordination of Care for Critically Ill Adults

CIU: Coordination of Care for Critically Ill Adults

For critically ill adults, the RD should implement medical nutrition therapy (MNT) and coordinate care with an interdisciplinary team, through:

- Requesting appropriate data
- Communicating with referring provider and all interdisciplinary team members
- Indicating specific areas of concern

This collaborative approach is necessary to effectively integrate MNT into overall management for critically ill patients.

Consensus, Imperative

CIU: Monitoring and Evaluation of Critically Ill Adults

CIU: Monitoring and Evaluation of Critically Ill Adults

Following the nutrition intervention, to check progress, the RD should monitor and evaluate at each visit the nutrient intake of critically ill adult patients and compare to desired individual outcomes relevant to the nutrition diagnosis and intervention. This may include, but is not limited to, the

following:

Food/Nutrition-Related History

- Adequacy and appropriateness of nutrient intake/nutrient delivery
- Actual daily intake from EN and PN and other nutrient sources
- Bioactive substances (prebiotics/probiotics, antioxidants, glutamine)

Anthropometric Measurements

- Weight
- Weight change

Biochemical Data, Medical Tests and Procedures

- Biochemical indices (glucose, electrolytes, others as warranted by clinical condition)
- Implications of diagnostic tests and therapeutic procedures (indirect calorimetry measurements, radiography for confirmation of feeding tube placement, other GI diagnostic tests)

Nutrition-Focused Physical Findings

- Nutrition-focused physical examination that includes, but is not limited to: fluid assessment, functional status, wound status, clinical signs of malnutrition/overnutrition and/or nutrient deficiencies
- Intake and output (I's and O's) including stool and fistula output, wound drainage
- Existing or potential access sites for delivery of nutrition support therapy
- Abdominal exam
- Fluid status (edema, ascites, dehydration)
- Vital signs

Client History

- Clinical status
- Medications

Monitoring and evaluation of the above factors is needed to correctly diagnose nutrition problems that should be the focus of further nutrition interventions. Inability to achieve optimal nutrient intake may contribute to poor outcomes.

Consensus, Imperative

Definitions:

Conditional vs. Imperative Recommendations

Recommendations can be worded as *conditional* or *imperative* statements. Conditional statements clearly define a specific situation, while imperative statements are broadly applicable to the target population without restraints on their pertinence. More specifically, a conditional recommendation can be stated in if/then terminology (e.g., If an individual does not eat food sources of omega-3 fatty acids, then 1g of EPA and DHA omega-3 fatty acid supplements *may* be recommended for secondary prevention).

In contrast, imperative recommendations "require," or "must," or "should achieve certain goals," but do not contain conditional text that would limit their applicability to specified circumstances. (e.g., Portion control should be included as part of a comprehensive weight management program. Portion control at meals and snacks results in reduced energy intake and weight loss).

Conclusion Grading Table

Strength of Evidence Elements	Grade I Good/Strong	Grade II Fair	Grade III Limited/Weak	Grade IV Expert Opinion Only	Grade V Grade Not Assignable
Quality	Studies of strong design for	Studies of	Studies of weak design	No studies available	No

Strength of Evidence Elements	Grade I Good/Strong Free from design flaws, bias and execution problems	Grade II Fair with minor methodological concerns OR Only studies of weaker study design for question	Grade III Limited/Weak OR Inconclusive findings due to design flaws, bias or execution problems	Grade IV Expert Opinion Only Conclusion based on usual practice, expert consensus, clinical experience, opinion, or extrapolation from basic research	Grade V Not Assignable Grade pertains to question that evidence being addressed
• Scientific rigor/validity • Considers design and execution	question	strong design for question	for answering the question		
Consistency Of findings across studies	Findings generally consistent in direction and size of effect or degree of association, and statistical significance with minor exceptions at most	Inconsistency among results of studies with strong design OR Consistency with minor exceptions across studies of weaker designs	Unexplained inconsistency among results from different studies OR Single study unconfirmed by other studies	Conclusion supported solely by statements of informed nutrition or medical commentators	NA
Quantity • Number of studies • Number of subjects in studies	One to several good quality studies Large number of subjects studied Studies with negative results having sufficiently large sample size for adequate statistical power	Several studies by independent investigators Doubts about adequacy of sample size to avoid Type I and Type II error	Limited number of studies Low number of subjects studied and/or inadequate sample size within studies	Unsubstantiated by published studies	Relevant studies have not been done
Clinical Impact • Importance of studied outcomes • Magnitude of effect	Studied outcome relates directly to the question Size of effect is clinically meaningful Significant (statistical) difference is large	Some doubt about the statistical or clinical significance of effect	Studied outcome is an intermediate outcome or surrogate for the true outcome of interest OR Size of effect is small or lacks statistical and/or clinical significance	Objective data unavailable	Indicates area for future research
Generalizability To population of interest	Studied population, intervention and outcomes are free from serious doubts about generalizability	Minor doubts about generalizability	Serious doubts about generalizability due to narrow or different study population, intervention or outcomes studied	Generalizability limited to scope of experience	NA

This grading system was based on the grading system from Greer, Mosser, Logan, & Wagstrom Halaas. A practical approach to evidence grading. Jt Comm J Qual Improv. 2000;26:700-712. In September 2004, The ADA Research Committee modified the grading system to this current version.

Criteria for Recommendation Rating

Statement Rating	Definition	Implication for Practice
Strong	A Strong recommendation means that the workgroup believes that the benefits of the recommended approach clearly exceed the harms (or that the harms clearly exceed the benefits in the case of a strong negative recommendation), and that the quality of the supporting evidence is excellent/good (grade I or II).* In some clearly identified circumstances, strong recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the harms.	Practitioners should follow a Strong recommendation unless a clear and compelling rationale for an alternative approach is present.
Fair	A Fair recommendation means that the workgroup believes that the benefits exceed the harms (or that the harms clearly exceed the benefits in the case of a negative recommendation), but the quality of evidence is not as strong (grade II or III).* In some clearly identified circumstances, recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits outweigh the harms.	Practitioners should generally follow a Fair recommendation but remain alert to new information and be sensitive to patient preferences.
Weak	A Weak recommendation means that the quality of evidence that exists is suspect or that well-done studies (grade I, II, or III)* show little clear advantage to one approach versus another.	Practitioners should be cautious in deciding whether to follow a recommendation classified as Weak, and should exercise judgment and be alert to emerging publications that report evidence. Patient preference should have a substantial influencing role.
Consensus	A Consensus recommendation means that Expert opinion (grade IV) supports the guideline recommendation even though the available scientific evidence did not present consistent results, or controlled trials were lacking.	Practitioners should be flexible in deciding whether to follow a recommendation classified as Consensus, although they may set boundaries on alternatives. Patient preference should have a substantial influencing role.
Insufficient Evidence	An Insufficient Evidence recommendation means that there is both a lack of pertinent evidence (grade V)* and/or an unclear balance between benefits and harms.	Practitioners should feel little constraint in deciding whether to follow a recommendation labeled as Insufficient Evidence and should exercise judgment and be alert to emerging publications that report evidence that clarifies the balance of benefit versus harm. Patient preference should have a substantial influencing role.

*Conclusion statements are assigned a grade based on the strength of the evidence. Grade I is good; grade II, fair; grade III, limited; grade IV signifies expert opinion only and grade V indicates that a grade is not assignable because there is no evidence to support or refute the conclusion. The evidence and these grades are considered when assigning a rating (Strong, Fair, Weak, Consensus, Insufficient Evidence - see chart above) to a recommendation.

Adapted by the Academy of Nutrition and Dietetics (AND) from the American Academy of Pediatrics, Classifying Recommendations for Clinical Practice Guideline, Pediatrics. 2004;114;874-877. Revised by the AND Evidence-Based Practice Committee, Feb 2006.

Clinical Algorithm(s)

The following algorithms are provided in the original guideline document:

- Critical Illness (CI) Nutrition Guideline Algorithm
- CI Nutrition Assessment
- CI Nutrition Diagnosis
- CI Nutrition Intervention
- CI Monitoring and Evaluation

Scope

Disease/Condition(s)

- Critical illness
- Medical and surgical conditions in which the patient requires care in an intensive care unit, such as:
  - Sepsis and systemic inflammatory response syndrome (SIRS)
  - Trauma
  - Neurological injury such as traumatic brain injury, stroke, amyotrophic lateral sclerosis (ALS), etc.
  - Pancreatitis
  - Respiratory failure
  - Multi-organ failure
  - Surgery

Guideline Category

Assessment of Therapeutic Effectiveness

Evaluation

Management

Treatment

Clinical Specialty

Critical Care

Gastroenterology

Internal Medicine

Neurology

Nursing

Nutrition

Pharmacology

Pulmonary Medicine

Surgery

Intended Users

Advanced Practice Nurses

Dietitians

Health Care Providers

Nurses

Pharmacists

Physician Assistants

Physicians

Respiratory Care Practitioners

Speech-Language Pathologists

Students

Guideline Objective(s)

Overall Objectives

- To help registered dietitians, practitioners, patients, families, and consumers make shared decisions about health care choices in specific clinical circumstances
- To provide medical nutrition therapy (MNT) guidelines for nutrition of the critically ill to enhance delivery and reduce complications

Specific Objectives

- To define evidence-based recommendations for the provision of enteral nutrition (EN) by registered dietitians (RDs) in collaboration with other healthcare providers
- To guide practice decisions that integrate medical and nutritional elements
- To reduce variations in practice among RDs
- To provide the RD with evidence-based practice recommendations to adjust the MNT or recommend other therapies to achieve positive outcomes
- To enhance the quality of life for the patient, utilizing customized strategies based on the individual's nutritional needs
- To promote optimal nutrition support within cost constraints of the healthcare environment

Target Population

Adult critically-ill patients 19 years and older requiring or eligible for enteral nutrition support in the intensive care unit (ICU)

Note: The evidence for the guideline did not specifically examine populations that were exclusively patients with burns. These guidelines are not applicable to pediatric populations.

Interventions and Practices Considered

Evaluation

1. Referral to a registered dietitian
2. Food and nutrition-related history assessment
3. Anthropometric measurements (weight, height, body mass index [BMI])
4. Biochemical data, diagnostic tests and procedures (e.g., glucose, electrolytes, indirect calorimetry measurement, radiography for confirmation of feeding tube placement, other gastrointestinal diagnostic tests)
5. Nutrition-focused physical examination
6. Client history
7. Reassessment of critically ill adults
8. Calculation of resting metabolic rate using the Penn State equations

Management

1. Individualized nutrition prescription for critically ill adults to include energy, protein, fiber, vitamins, minerals, fluid
2. Enteral vs. parenteral nutrition
3. Initiation of enteral nutrition
4. Feeding tube placement
5. Ensuring adequate enteral nutrition energy delivery (i.e., at least 60% of total estimated requirement)
6. Patient positioning
7. Monitoring gastric residual volume
8. Use of promotility agents
9. Use of immune-modulating enteral formulas containing some combination of arginine, glutamine, nucleotides, antioxidants and fish oil in patients with acute respiratory distress syndrome (ARDS) or acute lung injury
10. Addition of fiber to enteral nutrition to reduce diarrhea
11. Supplemental intravenous glutamine
12. Hypocaloric, high protein feeding regimens in the obese patient
13. Blood glucose control
14. Coordination of care with an interdisciplinary team
15. Monitoring and evaluation

Note: Blue dye use and supplemental enteral glutamine were considered but not recommended.

Major Outcomes Considered

Morbidity
Mortality
Changes in laboratory values
Infectious complications
Aspiration pneumonia
Length of hospital stay
Days on mechanical ventilation
Blood glucose level
Cost of medical care

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

General Methods for Collecting/Selecting the Evidence

The following list provides an overview of the steps which the Academy evidence analysis team goes through to identify research through database searches.

1. Plan the search strategy to identify the "current best evidence" relevant to the question. The plan for identification and inclusion of articles and reports should be systematic and reproducible, not haphazard. Write out the original search strategy and document adjustments to the strategy if they occur. Allow for several iterations of searches.
2. List inclusion and exclusion criteria. The work group will define the inclusion and exclusion criteria. These criteria will be used in defining the search strategy and for filtering the identified research reports. The Academy uses only peer-reviewed research; that is, articles accepted for

evidence analysis must be peer-reviewed and published in a juried publication. Additionally, the Academy only uses human subjects in its research and does not include animal studies in its evidence analysis.

3. Identify search words. During the process of considering outcomes, interventions, nutrition diagnoses, and assessments, the work group may have identified a number of specific terms or factors that were important, but were not included in the actual question. These terms can be used as additional search terms to help identify relevant pieces of research. Both text word search and keyword search using Medical Subject Headings (MeSH) definitions may be used.
4. Identify databases to search. PubMed, Medline, CINAHL, EMBASE, Cochrane, Agricola, DARE, TRIP, AHRQ and ERIC are some common databases for clinical nutritional research. Note that search terms can vary depending on the database.
5. Conduct the search. Depending on the number and type of sources found in the initial search, adjustments might have to be made in the search strategy and to inclusion/exclusion criteria, and additional searches run. Changes to the search plan should be recorded for future reference. Document the number of sources identified in each search.
6. Review titles and abstracts. At this point, a filtering procedure is used to determine whether a research article matches the inclusion criteria and is relevant to the work group's questions. Typically, the lead analyst, along with a member of the expert workgroup, first reviews the citations and abstracts to filter out reports that are not applicable to the question. If a determination cannot be made based on the citation and abstract, then the full text of the article is obtained for review.
7. Gather all remaining articles and reports. Obtain paper or electronic copies of research articles that remain on the list following the citation and abstract review. If there are less than six citations, it could mean that the search was too specific to identify relevant research or that research has not been done on this topic. A broadened search should be tried. When there is a long list of citations, ascertain whether it includes articles that are tangential to the question or address the question in only a general way. In this case a more focused search strategy may be necessary.

Specific Methods for This Guideline

The recommendations in the guideline were based on a systematic review of the literature. Searches of PubMed, Cochrane Database of Systematic Reviews, and Central databases and hand searches of other relevant literature were performed on the following topics:

- Determining resting metabolic rate
- Enteral versus parenteral nutrition
- Initiation of enteral nutrition
- Feeding tube site
- Enteral nutrition energy delivery
- Blue dye use
- Optimizing enteral nutrition delivery
- Immune-modulating enteral nutrition
- Enteral nutrition and fiber
- Supplemental enteral and intravenous glutamine
- Hypocaloric, high protein feeding regimen
- Blood glucose control

Each evidence analysis topic has a link to supporting evidence in the original guideline, where the Search Plan and Results can be found. Here the reader can view when the search plan was performed, specific inclusion and exclusion criteria, search terms, data bases that were searched, and the excluded articles.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Conclusion Grading Table

Strength of Evidence Elements	Grade I Good/Strong	Grade II Fair	Grade III Limited/Weak	Grade IV Expert Opinion Only	Grade V Grade Not Assignable
Quality • Scientific rigor/validity • Considers design and execution	Studies of strong design for question Free from design flaws, bias and execution problems	Studies of strong design for question with minor methodological concerns OR Only studies of weaker study design for question	Studies of weak design for answering the question OR Inconclusive findings due to design flaws, bias or execution problems	No studies available Conclusion based on usual practice, expert consensus, clinical experience, opinion, or extrapolation from basic research	No evidence that pertains to question being addressed
Consistency Of findings across studies	Findings generally consistent in direction and size of effect or degree of association, and statistical significance with minor exceptions at most	Inconsistency among results of studies with strong design OR Consistency with minor exceptions across studies of weaker designs	Unexplained inconsistency among results from different studies OR Single study unconfirmed by other studies	Conclusion supported solely by statements of informed nutrition or medical commentators	NA
Quantity • Number of studies • Number of subjects in studies	One to several good quality studies Large number of subjects studied Studies with negative results having sufficiently large sample size for adequate statistical power	Several studies by independent investigators Doubts about adequacy of sample size to avoid Type I and Type II error	Limited number of studies Low number of subjects studied and/or inadequate sample size within studies	Unsubstantiated by published studies	Relevant studies have not been done
Clinical Impact • Importance of studied outcomes • Magnitude of effect	Studied outcome relates directly to the question Size of effect is clinically meaningful Significant (statistical) difference is large	Some doubt about the statistical or clinical significance of effect	Studied outcome is an intermediate outcome or surrogate for the true outcome of interest OR Size of effect is small or lacks statistical and/or clinical significance	Objective data unavailable	Indicates area for future research
Generalizability	Studied population,	Minor doubts	Serious doubts about	Generalizability limited to	NA

Strength of Evidence Elements	Grade I	Grade II	Grade III	Grade IV	Grade V
To population of interest	Good/Strong	Fair	Limited/Weak	Expert Opinion Only	Grade Not Assignable
	intervention and outcomes are free from serious doubts about generalizability	about generalizability	generalizability due to narrow or different study population, intervention or outcomes studied	scope of experience	

This grading system was based on the grading system from Greer, Mosser, Logan, & Wagstrom Halaas. A practical approach to evidence grading. Jt Comm J Qual Improv. 2000;26:700-712. In September 2004, The ADA Research Committee modified the grading system to this current version.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Step 1: Formulate Evidence Analysis Question

Specify a question in a defined area of practice; or state a tentative conclusion or recommendation that is being considered. Include the patient type and special needs of the target population involved, the alternatives under consideration, and the outcomes of interest (PICO format).

Step 2: Gather and Classify Evidence

Conduct a systematic search of the literature to find evidence related to the question, gather studies and reports, and classify them by type of evidence. Classes differentiate primary reports of new data according to study design, and distinguish them from secondary reports that include systematic and/or narrative review.

Step 3: Critically Appraise Each Article

Review each article for relevance to the question and use the checklist of questions to evaluate the research design and implementation. Abstract key information from the report.

Step 4: Summarize Evidence

Synthesize the reports into an overview table and summarize the research relevant to the question.

Step 5: Write and Grade the Conclusion Statement

Develop a concise conclusion statement (the answer to the question). Assign a grade to indicate the overall strength or weakness of evidence informing the conclusion statement (see the "Rating Scheme for the Strength of the Evidence" field).

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Moving from Analysis to the Evidence-Based Nutrition Practice Guideline

The expert work group, which includes practitioners and researchers with a depth of experience in the specific field of interest, develops the disease-specific guideline. The guideline development involves the following steps:

Review the Conclusion Statements

The work group meets to review the materials resulting from the evidence analysis, which may include conclusion statements, evidence summaries, and evidence worksheets.

Formulate Recommendations for the Guideline Integrating Conclusions from Evidence Analysis

The work group uses an expert consensus method to formulate the guideline recommendations and complete the various sections on the recommendation page. These include:

- Recommendation(s): This is a course of action for the practitioner. The recommendation is written using two brief and separate statements. The first statement is "what" the dietitian should do or not do. The second statement describes the "why" of the recommendation. More than one recommendation may be formulated depending on a particular topic and the supporting conclusion statements.
- Rating: The rating for the recommendation is based on the strength of the supporting evidence. The grade of the supporting conclusion statement(s) will be help determining this rating (see the "Rating Scheme for the Strength of the Recommendations" field).
- Label of Conditional or Imperative: Each recommendation will have a label of "conditional" or "imperative." Conditional statements clearly define a specific situation, while imperative statements are broadly applicable to the target population without restraints on their pertinence.
- Risks and Harms of Implementing the Recommendations: Includes any potential risks, anticipated harms or adverse consequences associated with applying the recommendation(s) to the target population.
- Conditions of Application: Includes any organizational barriers or changes that would need to be made within an organization to apply the recommendation in daily practice. Also includes any conditions which may limit the application of the recommendation(s). For instance, application may be limited to only people in an inpatient setting, or not applicable for pregnant women. Conditional recommendations will always have conditions specified. Imperative recommendations may have some general conditions for application.
- Potential Costs Associated with Application: Includes any costs that may be associated with the application of this recommendation such as specialized staff, new equipment or treatments.
- Recommendation Narrative: Provides a brief description of the evidence that supports this recommendation.
- Recommendation Strength Rationale: Provides a brief list of the evidence strength and methodological issues that determined the recommendation strength.
- Minority Opinions: If the expert work group cannot reach consensus on the recommendation, the minority opinions may be listed here.
- Supporting Evidence: Provides links to the conclusions statements, evidence summaries and worksheets related to the formulation of this recommendation(s).

References Not Graded in the Academy's Evidence Analysis Process

Recommendations are based on the summarized evidence from the analysis. Sources that are not analyzed during the evidence analysis process may be used to support and formulate the recommendation or to support information under other categories on the recommendation page, if the workgroup deems necessary. References must be credible resources (e.g., consensus reports, other guidelines, position papers, standards of practice, articles from peer-reviewed journals, nationally recognized documents or websites). If recommendations are based solely on these types of references, they will be rated as "consensus."

Occasionally recommendations will include references that were not reviewed during the evidence analysis process but are relevant to the recommendation, risks and harms of implementing the recommendation, conditions of application, or potential costs associated with application. These references will be listed on the recommendation page under "References Not Graded in the Academy's Evidence Analysis Process."

Develop a Clinical Algorithm for the Guideline

The work group develops a clinical algorithm based on Academy's Nutrition Care Process, to display how each recommendation can be used within the treatment process and how they relate to the Nutrition Assessment, Diagnosis, Intervention and Monitoring and Evaluation.

Complete the Writing of the Guideline

Each disease-specific guideline has a similar format which incorporates the Introduction (includes: Scope of the Guideline, Statement of Intent, Guideline Methods, Implementation, Benefits and Risks/Harms of Implementation), Background Information and any necessary Appendices. The work group develops these features.

Criteria Used in Guideline Development

The criteria used in determining the format and process for development of Academy's guidelines are based on the following tools and criteria for evidence-based guidelines:

- Guideline Elements Model (GEM) which has been incorporated by the American Society for Testing and Materials (ASTM) as a Standard

Specification for clinical practice guidelines

- AGREE (Appraisal for Guidelines Research and Evaluation) Instrument
- National Guideline Clearinghouse www.guideline.gov

Rating Scheme for the Strength of the Recommendations

Criteria for Recommendation Rating

Statement Rating	Definition	Implication for Practice
Strong	A Strong recommendation means that the workgroup believes that the benefits of the recommended approach clearly exceed the harms (or that the harms clearly exceed the benefits in the case of a strong negative recommendation), and that the quality of the supporting evidence is excellent/good (grade I or II).* In some clearly identified circumstances, strong recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the harms.	Practitioners should follow a Strong recommendation unless a clear and compelling rationale for an alternative approach is present.
Fair	A Fair recommendation means that the workgroup believes that the benefits exceed the harms (or that the harms clearly exceed the benefits in the case of a negative recommendation), but the quality of evidence is not as strong (grade II or III).* In some clearly identified circumstances, recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits outweigh the harms.	Practitioners should generally follow a Fair recommendation but remain alert to new information and be sensitive to patient preferences.
Weak	A Weak recommendation means that the quality of evidence that exists is suspect or that well-done studies (grade I, II, or III)* show little clear advantage to one approach versus another.	Practitioners should be cautious in deciding whether to follow a recommendation classified as Weak, and should exercise judgment and be alert to emerging publications that report evidence. Patient preference should have a substantial influencing role.
Consensus	A Consensus recommendation means that Expert opinion (grade IV) supports the guideline recommendation even though the available scientific evidence did not present consistent results, or controlled trials were lacking.	Practitioners should be flexible in deciding whether to follow a recommendation classified as Consensus, although they may set boundaries on alternatives. Patient preference should have a substantial influencing role.
Insufficient Evidence	An Insufficient Evidence recommendation means that there is both a lack of pertinent evidence (grade V)* and/or an unclear balance between benefits and harms.	Practitioners should feel little constraint in deciding whether to follow a recommendation labeled as Insufficient Evidence and should exercise judgment and be alert to emerging publications that report evidence that clarifies the balance of benefit versus harm. Patient preference should have a substantial influencing role.

*Conclusion statements are assigned a grade based on the strength of the evidence. Grade I is good; grade II, fair; grade III, limited; grade IV signifies expert opinion only and grade V indicates that a grade is not assignable because there is no evidence to support or refute the conclusion. The evidence and these grades are considered when assigning a rating (Strong, Fair, Weak, Consensus, Insufficient Evidence - see chart above) to a recommendation.

Adapted by the Academy of Nutrition and Dietetics (AND) from the American Academy of Pediatrics, Classifying Recommendations for Clinical Practice Guideline, Pediatrics. 2004;114;874-877. Revised by the AND Evidence-Based Practice Committee, Feb 2006.

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Each guideline is reviewed internally and externally using the AGREE (Appraisal of Guidelines for Research and Evaluation) Instrument as the evaluation tool. The external reviewers consist of an interdisciplinary group of individuals (may include dietitians, doctors, psychologists, nurses, etc.). The guideline is adjusted by consensus of the expert panel and approved by Academy's Evidence-Based Practice Committee prior to publication on the Evidence Analysis Library (EAL).

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

The guideline contains conclusion statements that are supported by evidence summaries and evidence worksheets. These resources summarize the important studies (randomized controlled trials [RCTs], clinical studies, observational studies, cohort and case-control studies) pertaining to the conclusion statement and provide the study details.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Evidence-based nutrition practice guidelines are developed to help dietetic practitioners, patients and consumers make shared decisions about health care choices in specific clinical circumstances. If properly developed, communicated and implemented, guidelines can improve care.
- A priority aim and benefit of implementing this guideline is to increase the percentage of individuals who are appropriately nourished while in the intensive care unit (ICU), leading to an early ICU discharge, with fewer infectious complications and avoidance of aspiration pneumonia.
- Enteral nutrition (EN) begun within 24 to 48 hours of injury or admission to the ICU is associated with fewer infectious complications.
- Feeding tubes placed in the small bowel are associated with reduced ventilator-associated pneumonia (VAP)
- Use of promotility agents is associated with lower gastric residual volumes (GRV).
- Positioning the head of the patient's bed at 45 degrees reduces the incidence of aspiration pneumonia and reflux of gastric contents.
- Intake of EN is greater if an isolated GRV of 500 ml is accepted in the absence of other signs of intolerance.
- Glycemic control (140 mg/dL to 180 mg/dL) is associated with reduced time on the ventilator for medical ICU patients.
- Actual delivery of greater than 60% of EN goal is associated with fewer infectious complications in critically ill adult patients.
- Compared with parenteral nutrition (PN), EN results in fewer infectious complications, septic morbidity, and a lower cost of medical care.
- Providing obese ICU patients with hypocaloric, high protein feeding (<20 kcal per kg adjusted body weight [ABW] and 2 g protein per kg ideal body weight [IBW]) may promote shorter ICU stays, but may not reduce hospital length of stay (LOS).
- Glutamine (GLN)-supplemented PN reduces infectious complications in adult critically ill patients.
- Addition of guar gum to enteral formula may reduce diarrhea in adult critically ill patients.
- For ICU patients without acute respiratory distress syndrome (ARDS), acute lung injury or severe sepsis, immune-modulating enteral formulas containing some combination of arginine, glutamine, nucleotides, antioxidants and fish oil have shown benefits in reducing infectious

complications and LOS.

Potential Harms

Overall Risk/Harm Considerations

Safety issues should be considered for each form of treatment recommended. General benefits and risks associated with implementation of the guideline are addressed for each recommendation.

Recommendation-Specific Risks/Harms

Enteral vs. Parenteral Nutrition

A series of case studies have indicated that jejunally fed enteral nutrition (EN) administered to patients with inadequate mesenteric perfusion may be associated with hypoxia and might promote the development of small bowel hypoxia and necrosis. EN should be withheld in hypotensive patients with a mean arterial pressure of <60 mm Hg and/or receiving escalating doses of pharmacologic agents (e.g., epinephrine, norepinephrine, dopamine, etc.) to maintain hemodynamic stability.

Determination of Resting Metabolic Rate

- Anxiety may be caused by indirect calorimetry procedures employing a face mask or canopy.
- In some individuals, estimation of resting metabolic rate with predictive equations will lead to under- or overfeeding.

Nutrition Prescription for Critically Ill Adults

- Over- or underfeeding may lead to metabolic and clinical complications and subsequent poor outcomes.
- Provision of nutrition support, including EN or parenteral nutrition (PN), to nutritionally compromised critically ill patients may be associated with patient complications including, but not limited to: aspiration; infections, including catheter-related infections; metabolic complications resulting from under- or overfeeding; gastrointestinal (GI) complications, including diarrhea; provision of excessive or inadequate fluid may lead to inappropriate hydration status and subsequent poor outcomes.

Gastric vs. Small Bowel Feeding Tube Placement

- If there is a delay due to small bowel placement underfeeding may result and benefits of early initiation of EN may be lost.
- Repeated confirmation X-rays increase radiation exposure.

Enteral Nutrition Energy Delivery

- Feeding medical ICU patients more than 70% of goal intake in the first five days of ICU stay is associated with a lower chance of being discharged alive or breathing spontaneously when discharged from the ICU.
- Providing surgical patients with obesity more than 70% of goal intake over a seven-day period is associated with a longer hospital length of stay (LOS) and more days of antibiotics.

Optimizing Enteral Nutrition Delivery

Patient Positioning

Long-term use of 45-degree head of bed elevation may be associated with increased pressure over the ischial tuberosities and may expose the patient to greater shearing forces due to gravity-related sliding in the bed.

Gastric Residual Volume

Potential for reduced EN delivery if formula is repeatedly stopped or held.

Promotility Agents

- Adverse reactions that have been documented in randomized controlled trials (RCTs) with the use of metoclopramide include: depression, high blood pressure, headache, skin rash, fatigue, fever, insomnia, decrease of libido, nausea, sedation, tremor and agitation, dyslalia, and dysphagia.
- Chronic use of metoclopramide may have adverse effects. Chronic use of metoclopramide can cause tardive dyskinesia (TD), a syndrome

characterized by persistent, potentially irreversible, abnormal, involuntary repetitive movements. While rare, TD is a serious, and potentially irreversible adverse effect of metoclopramide.

Immune-Modulating Enteral Nutrition

The use of immune-modulating EN containing arginine in severely ill patients may be associated with increased mortality.

Supplemental Glutamine

- Use caution in fluid-restricted patients receiving supplemental intravenous (IV) glutamine outside the primary PN solution. A commercially available IV glutamine solution with a concentration of 2.5% is currently available; therefore an increased volume of fluid is required to provide effective dosing.
- Use caution in patients who are at risk for hyperammonemia (hepatic dysfunction) or azotemia (renal dysfunction)

Hypocaloric, High Protein Feeding Regimen

- Potential risks or harms of hypocaloric, high protein feeding beyond four weeks in obese, critically ill patients are unknown due to very limited evidence in this population.
- Tube feedings often do not reach delivery goal due to interruptions and delays. Underfeeding beyond the level intended may occur and has been associated with negative outcomes. Frequent monitoring and/or adjustment of energy and protein delivery may be required to meet low calorie, high protein EN prescription.

Blood Glucose Control

- Treatment of hyperglycemia may increase risk for hypoglycemia.
- Insulin clearance is impaired by certain clinical conditions (kidney disease, liver disease) and may increase risk for hypoglycemia.
- Serum glucose levels over 180 mg per dL are associated with increased mortality in critically ill patients.

Contraindications

Contraindications

- This guideline should not be used when aggressive medical care is no longer desired. The appropriateness of a clinical intervention involves a substantial element of personal choice or values of the patient, which includes advance directives. Although nutrition support is often warranted for the critically ill patient, occasionally, support may be contraindicated due to the patient's clinical status or patient preference. Therefore, a comprehensive nutrition assessment and ongoing reassessment is necessary to determine whether the initiation or continued provision of support is appropriate.
- Enteral nutrition (EN) is contraindicated in patients with hemodynamic instability, bowel obstruction, high output fistula, or severe ileus.
- Raising the head of bed to 30 to 45 degrees may be contraindicated in specific medical conditions that require the patient to be supine (e.g., back and neck surgery, hypotension)
- Metoclopramide is contraindicated:
  - Whenever stimulation of the gastrointestinal (GI) motility might be dangerous (i.e., in the presence of GI hemorrhage, mechanical obstruction or perforation)
  - In patients with pheochromocytoma and in those with known sensitivity or intolerance to the drug
  - In epileptics or patients receiving other drugs which are likely to cause extrapyramidal reactions, since the frequency and severity of seizures or extrapyramidal reactions may be increased
- Use of fiber is contraindicated in patients with hemodynamic instability, high risk for bowel ischemia, severe dysmotility, and positive *Clostridium difficile*.

Qualifying Statements

Qualifying Statements

- While the evidence-based nutrition practice guidelines represent a statement of best practice based on the latest available evidence at the time of publishing, they are not intended to overrule professional judgment. Rather, they may be viewed as a relative constraint on individual clinician discretion in a particular clinical circumstance. The independent skill and judgment of the health care provider must always dictate treatment decisions. These nutrition practice guidelines are provided with the express understanding that they do not establish or specify particular standards of care, whether legal, medical or other.
- This nutrition practice guideline is meant to serve as a general framework for handling clients with particular health problems. It may not always be appropriate to use these nutrition practice guidelines to manage clients because individual circumstances may vary. For example, different treatments may be appropriate for clients who are severely ill or who have co-morbid, socioeconomic, or other complicating conditions.

The Role of Patient Preference

- This guideline recognizes the role of patient preferences for possible outcomes of care, when the appropriateness of a clinical intervention involves a substantial element of personal choice or values. With regard to types of evidence that are associated with particular outcomes, two major classes have been described. Patient-oriented evidence that matters (POEM) deals with outcomes of importance to patients, such as changes in morbidity, mortality or quality of life. Disease-oriented evidence (DOE) deals with surrogate end-points, such as changes in laboratory values or other measures of response. Although the results of DOE sometimes parallel the results of POEM, they do not always correspond.
- When possible, the Academy of Nutrition and Dietetics recommends using POEM-type evidence rather than DOE. When DOE is the only guidance available, the guideline indicates that key clinical recommendations lack the support of outcomes evidence.

Implementation of the Guideline

Description of Implementation Strategy

The publication of this guideline is an integral part of the plans for getting the Academy of Nutrition and Dietetics evidence-based recommendations on critical illness to all dietetics practitioners engaged in, teaching about, or researching critical illness as quickly as possible. National implementation workshops at various sites around the country and during the Academy Food Nutrition Conference Expo (FNCE) are planned. Additionally, there are recommended dissemination and adoption strategies for local use of the *Academy Critical Illness Evidence-Based Nutrition Practice Guideline*.

The guideline development team recommended multi-faceted strategies to disseminate the guideline and encourage its implementation. Management support and learning through social influence are likely to be effective in implementing guidelines in dietetic practice. However, additional interventions may be needed to achieve real change in practice routines.

Implementation of the Critical Illness guideline will be achieved by announcement at professional events, presentations and training. Some strategies include:

- National and Local Events – State dietetic association meetings and media coverage will help launch the guideline.
- Local Feedback Adaptation – Presentation by members of the work group at peer review meetings and opportunities for continuing education units (CEUs) for courses completed
- Education Initiatives – The guideline and supplementary resources are freely available for use in the education and training of dietetic interns and students in approved Accreditation Council for Education in Nutrition and Dietetics (ACEND) programs.
- Champions – Local champions have been identified and expert members of the guideline team will prepare articles for publications. Resources are provided that include PowerPoint presentations, full guidelines, and pre-prepared case studies.
- Practical Tools – Some of the tools that will be developed to help implement the guideline include specially designed resources such as clinical algorithms, a toolkit, and slide presentation.

Specific distribution strategies include:

Publication in Full – The guideline will be available electronically at the Academy Evidence Analysis Library Web site and will be announced to all the dietetic practice groups. Academy Evidence Analysis Library will also provide downloadable supporting information.

Implementation Tools

Clinical Algorithm

Quick Reference Guides/Physician Guides

Slide Presentation

Tool Kits

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Patient-centeredness

Safety

Timeliness

Identifying Information and Availability

Bibliographic Source(s)

Academy of Nutrition and Dietetics. Critical illness evidence-based nutrition practice guideline. Chicago (IL): Academy of Nutrition and Dietetics; 2012. Various p.

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2006 Sep (revised 2012)

Guideline Developer(s)

Academy of Nutrition and Dietetics - Professional Association

Source(s) of Funding

The Academy acknowledges and is grateful for support from financial contributors; however the Academy's Research and Strategic Business Development staff maintains full control over the content and process of all evidence analysis projects including the selection of topics, evaluation of research, assignment of grades, and development of recommendations.

Guideline Committee

Critical Illness Evidence-Based Guideline Expert Workgroup

Composition of Group That Authored the Guideline

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Financial Disclosures/Conflicts of Interest

In the interest of full disclosure, the Academy has adopted the policy of revealing relationships work group members have with companies that sell products or services that are relevant to this guideline topic. Work group members are required to disclose potential conflicts of interest by completing the Academy Conflict of Interest Form. It should not be assumed that these financial interests will have an adverse impact on the content of the guideline, but they are noted here to fully inform readers.

Susan Roberts is employed with Baylor University Medical Center/Aramark Healthcare. She has received Honorarium from Abbott Nutrition and holds memberships with ASPEN. Mary K. Russell has consulted for Abbott Nutrition Health Institute.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: American Dietetic Association (ADA). Critical illness evidence-based nutrition practice guideline. Chicago (IL): American Dietetic Association (ADA); 2006 Sep. Various p.

Guideline Availability

Electronic copies: Available to members from the Academy of Nutrition and Dietetics Web site .

Availability of Companion Documents

The following are available:

- Academy of Nutrition and Dietetics critical illness evidence-based nutrition practice guideline. Executive summary of recommendations. Chicago (IL): Academy of Nutrition and Dietetics; 2012. Electronic copies: Available from the Academy of Nutrition and Dietetics (AND) Web site .
- Academy of Nutrition and Dietetics critical illness evidence-based nutrition practice guideline presentation. Slide set. 55 p. Chicago (IL): Academy of Nutrition and Dietetics; 2012. Electronic copies: Available for purchase from the AND Web site .
- Academy of Nutrition and Dietetics critical illness evidence-based nutrition practice guideline toolkit. Chicago (IL): Academy of Nutrition and Dietetics; 2010. Electronic and print copies: Available for purchase from the AND Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on November 6, 2008. The information was verified by the guideline developer on December 9, 2008. This summary was updated by ECRI Institute on April 1, 2009 following the FDA advisory on Reglan (metoclopramide). This NGC summary was amended by ECRI Institute on October 5, 2009, following the withdrawal of the blood glucose control recommendation. This summary was updated by ECRI Institute on March 25, 2013.

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